What is claimed is:

1. A display apparatus which expresses luminance by varying light emission time length and displays gray scale by using a subfield method, comprising:

a gain control circuit compressing the number of gray scale levels of an input signal and outputting a first intermediate image signal with a first number of gray scale levels;

a sub gain control circuit receiving said first intermediate image signal, compressing the number of gray scale levels of said first intermediate image signal, and outputting a second intermediate image signal with a second number of gray scale levels; and

an error diffusion circuit receiving said second intermediate image signal and increasing the number of gray scale levels by simulating additional gray scale levels through error diffusion.

2. The display apparatus as claimed in claim 1, further comprising:

a first subfield arrangement setting unit forming one field with a plurality of subfields so that the number of gray scale levels becomes equal to said first number of gray scale levels; and

a second subfield arrangement setting unit forming one field with a plurality of subfields so that the number of gray scale levels becomes equal to said second number of gray scale levels which is smaller than said first number of gray scale levels.

3. The display apparatus as claimed in claim 2, wherein said first subfield arrangement setting unit assigns a weight 1 to a first subfield and a weight 3 or larger to a second subfield.

4. The display apparatus as claimed in claim 2, wherein the ratio of the weight assigned to each subfield in said first subfield arrangement setting unit to the weight assigned to each subfield in said second subfield arrangement setting unit is approximately m:n (where m

and n are natural numbers, and n < m).

5. The display apparatus as claimed in claim 2, wherein of the subfields to be set for light emission when displaying an arbitrary gray scale level except low gray scale levels, said second subfield arrangement setting unit sets the most heavily weighted subfield for light emission along with at least one of the other subfields.

6. The display apparatus as claimed in claim 2, wherein said first subfield arrangement setting unit sets the arrangement of said plurality of subfields to achieve said first number of gray scale levels, m, and said second subfield arrangement setting unit sets the arrangement of said plurality of subfields to achieve said second number of gray scale levels, n (where m and n are natural numbers, and n < m).

7. The display apparatus as claimed in claim 6, wherein the number of gray scale levels, m, generated by said first subfield arrangement setting unit and the number of gray scale levels, n, generated by said second subfield arrangement setting unit have a relationship such that (m-1):(n-1) is substantially equal to a ratio of integers.

8. The display apparatus as claimed in claim 7, wherein said ratio (m-1):(n-1) is 2:3, 4:5, or 4:7.

9. The display apparatus as claimed in claim 6, wherein said sub gain control circuit generates said second intermediate image signal with said second number of gray scale levels by compressing said first intermediate image signal with said first number of gray scale levels through multiplication with (n-1)/(m-1).

10. The display apparatus as claimed in claim 9, wherein said sub gain control circuit divides n gray scale levels into a plurality of regions, and performs the multiplication with said coefficient (n-1)/(m-1) by approximating said divided regions by a broken line formed of a set of straight line segments each having a

slope equal to a submultiple of a natural number.

11. The display apparatus as claimed in claim 10, wherein the slope of each of said straight line segments in said broken line approximation is selected from the group consisting of 1, 1/2, 1/3, and 1/4.

12. The display apparatus as claimed in claim 9, further comprising a weight setting unit multiplying each weight by (m-1)/(n-1) in order to expand said image signal compressed through the multiplication with said coefficient (n-1)/(m-1) in said sub gain control circuit and output via said error diffusion circuit.

13. The display apparatus as claimed in claim 1, wherein said image signal is any one of RGB signals of red, green, and blue; and said gain control circuit, said sub gain control circuit, and said error diffusion circuit are provided for each of said RGB signals.

14. The display apparatus as claimed in claim 1, wherein said display apparatus is a plasma display apparatus.

15. A display apparatus which expresses luminance by varying light emission time length and displays gray scale by using a subfield method, comprising:

a main path generating, from an input signal with a first number of gray scale levels, a first image signal with a second number of gray scale levels which is smaller than said first number of gray scale levels;

a sub path generating a second image signal with a third number of gray scale levels which is smaller than said second number of gray scale levels;

a switch circuit outputting said first image signal generated by said main path or said second image signal generated by said sub path by switching therebetween; and

a path switching control section detecting, from said input image signal and a signal obtained by processing said input image signal, a motion

region where the amount of image motion is larger than a predetermined value, and in said motion region, switching said switch circuit from said first image signal to said second image signal, and wherein said main path comprises:

a gain control circuit receiving said input image signal with said first number of gray scale levels and outputting a first intermediate image signal with a fourth number of gray scale levels;

a sub gain control circuit receiving said first intermediate image signal and outputting a second intermediate image signal which has said second number of gray scale levels; and

an error diffusion circuit receiving an output signal of said sub gain control circuit, applying error diffusion, and outputting said first image signal.

16. The display apparatus as claimed in claim 15, further comprising:

a first subfield arrangement setting unit forming one field with a plurality of subfields so that the number of gray scale levels becomes equal to said fourth number of gray scale levels; and

a second subfield arrangement setting unit forming one field with a plurality of subfields so that the number of gray scale levels becomes equal to said second number of gray scale levels which is smaller than said fourth number of gray scale levels.

17. The display apparatus as claimed in claim 16, wherein said first subfield arrangement setting unit assigns a weight 1 to a first subfield and a weight 3 or larger to a second subfield.

18. The display apparatus as claimed in claim 16, wherein the ratio of the weight assigned to each subfield in said first subfield arrangement setting unit to the weight assigned to each subfield in said second subfield arrangement setting unit is approximately m:n (where m and n are natural numbers, and $n < m$).

19. The display apparatus as claimed in claim 16, wherein of the subfields to be set for light emission when displaying an arbitrary gray scale level except low gray scale levels, said second subfield arrangement setting unit sets the most heavily weighted subfield for light emission along with at least one of the other subfields.

20. The display apparatus as claimed in claim 16, wherein said first subfield arrangement setting unit sets the arrangement of said plurality of subfields to achieve said fourth number of gray scale levels, m, and said second subfield arrangement setting unit sets the arrangement of said plurality of subfields to achieve said second number of gray scale levels, n (where m and n are natural numbers, and $n < m$).

21. The display apparatus as claimed in claim 20, wherein the number of gray scale levels, m, generated by said first subfield arrangement setting unit and the number of gray scale levels, n, generated by said second subfield arrangement setting unit have a relationship such that $(m-1):(n-1)$ is substantially equal to a ratio of integers.

22. The display apparatus as claimed in claim 21, wherein said ratio $(m-1):(n-1)$ is 2:3, 4:5, or 4:7.

23. The display apparatus as claimed in claim 20, wherein said sub gain control circuit generates said second intermediate image signal with said second number of gray scale levels by compressing said first intermediate image signal with said fourth number of gray scale levels through multiplication with $(n-1)/(m-1)$.

24. The display apparatus as claimed in claim 23, wherein said sub gain control circuit divides n gray scale levels into a plurality of regions, and performs the multiplication with said coefficient $(n-1)/(m-1)$ by approximating said divided regions by a broken line formed of a set of straight line segments each having a slope equal to a submultiple of a natural number.

25. The display apparatus as claimed in claim 24, wherein the slope of each of said straight line segments in said broken line approximation is selected from the group consisting of 1, 1/2, 1/3, and 1/4.

26. The display apparatus as claimed in claim 23, further comprising a weight setting unit multiplying each weight by (m-1)/(n-1) in order to expand said first image signal compressed through the multiplication with said coefficient (n-1)/(m-1) in said sub gain control circuit and output via said error diffusion circuit.

27. The display apparatus as claimed in claim 15, wherein said image signal is any one of RGB signals of red, green, and blue; and said main path, said sub path, said switch circuit, said path switching control section, said gain control circuit, said sub gain control circuit, and said error diffusion circuit are provided for each of said RGB signals.

28. The display apparatus as claimed in claim 15, wherein said display apparatus is a plasma display apparatus.

29. A display driving method for driving a display that expresses luminance by varying light emission time length and displays gray scale by using a subfield method, said driving method comprising the steps of:

generating a first intermediate image signal with a first number of gray scale levels by compressing the number of gray scale levels of an input signal;

generating a second intermediate image signal with a second number of gray scale levels by further compressing the number of gray scale levels of said first intermediate image signal; and

generating an output image signal by applying error diffusion to said second intermediate image signal.

30. The display driving method as claimed in claim 29, further comprising the steps of:

performing first subfield arrangement setting to form one field with a plurality of subfields so that the number of gray scale levels becomes equal to said first number of gray scale levels; and

performing second subfield arrangement setting to form one field with a plurality of subfields so that the number of gray scale levels becomes equal to said second number of gray scale levels which is smaller than said first number of gray scale levels.

31. The display driving method as claimed in claim 30, wherein, in said first subfield arrangement setting, a weight 1 is assigned to a first subfield and a weight 3 or larger is assigned to a second subfield.

32. The display driving method as claimed in claim 30, wherein the ratio of the weight assigned to each subfield in said first subfield arrangement setting to the weight assigned to each subfield in said second subfield arrangement setting is approximately m:n (where m and n are natural numbers, and $n < m$).

33. The display driving method as claimed in claim 30, wherein, in said second subfield arrangement setting, of the subfields to be set for light emission when displaying an arbitrary gray scale level except low gray scale levels, the most heavily weighted subfield is set for light emission along with at least one of the other subfields.

34. The display driving method as claimed in claim 30, wherein said first subfield arrangement setting sets the arrangement of said plurality of subfields to achieve said first number of gray scale levels, m, and said second subfield arrangement setting sets the arrangement of said plurality of subfields to achieve said second number of gray scale levels, n (where m and n are natural numbers, and $n < m$).

35. The display driving method as claimed in claim 34, wherein the number of gray scale levels, m, generated in said first subfield arrangement setting and the number

of gray scale levels, n, generated in said second subfield arrangement setting have a relationship such that (m-1):(n-1) is substantially equal to a ratio of integers.

36. The display driving method as claimed in claim 35, wherein said ratio (m-1):(n-1) is 2:3, 4:5, or 4:7.

37. The display driving method as claimed in claim 34, wherein the generation of said second intermediate image signal performed by further compressing the number of gray scale levels of said first intermediate image signal is accomplished by multiplying said first intermediate image signal by (n-1)/(m-1).

38. The display driving method as claimed in claim 37, wherein the generation of said second intermediate image signal performed by further compressing the number of gray scale levels of said first intermediate image signal comprises dividing n gray scale levels into a plurality of regions and multiplying said first intermediate image signal by (n-1)/(m-1) by approximating said divided regions by a broken line formed of a set of straight line segments each having a slope equal to a submultiple of a natural number.

39. The display driving method as claimed in claim 38, wherein the slope of each of said straight line segments in said broken line approximation is selected from the group consisting of 1, 1/2, 1/3, and 1/4.

40. The display driving method as claimed in claim 37, further comprising the step of multiplying each weight by (m-1)/(n-1) in order to expand said output image signal compressed through the multiplication with said coefficient (n-1)/(m-1) and output after said error diffusion.

41. The display driving method as claimed in claim 29, wherein said image signal is any one of RGB signals of red, green, and blue; and gain control circuit, said sub gain control circuit, and said error diffusion circuit are provided for each of said RGB signals.

42. The display driving method as claimed in claim 29, wherein said display apparatus is a plasma display apparatus.

43. A display driving method for driving a display that expresses luminance by varying light emission time length and displays gray scale by using a subfield method, said display comprising:

a main path generating, from an input signal with a first number of gray scale levels, a first image signal with a second number of gray scale levels which is smaller than said first number of gray scale levels;

a sub path generating a second image signal with a third number of gray scale levels which is smaller than said second number of gray scale levels;

a switch circuit outputting said first image signal generated by said main path or said second image signal generated by said sub path by switching therebetween; and

a path switching control section detecting, from said input image signal and a signal obtained by processing said input image signal, a motion region where the amount of image motion is larger than a predetermined value, and in said motion region, switching said switch circuit from said first image signal to said second image signal, and wherein, in said main path,

a first computation is performed to compress said input image signal with said first number of gray scale levels, thereby generating a first intermediate image signal with a fourth number of gray scale levels;

a second computation is performed to further compress said first intermediate image signal, thereby outputting a second intermediate image signal having said second number of gray scale levels which is smaller than said fourth number of gray scale levels; and

error diffusion is applied to said sub

gain control circuit, thereby generating said first image signal.

44. The display driving method as claimed in claim 43, further comprising the steps of:

performing first subfield arrangement setting to form one field with a plurality of subfields so that the number of gray scale levels becomes equal to said fourth number of gray scale levels; and

performing second subfield arrangement setting to form one field with a plurality of subfields so that the number of gray scale levels becomes equal to said second number of gray scale levels which is smaller than said fourth number of gray scale levels.

45. The display driving method as claimed in claim 44, wherein, in said first subfield arrangement setting, a weight 1 is assigned to a first subfield and a weight 3 or larger is assigned to a second subfield.

46. The display driving method as claimed in claim 44, wherein the ratio of the weight assigned to each subfield in said first subfield arrangement setting to the weight assigned to each subfield in said second subfield arrangement setting is approximately m:n (where m and n are natural numbers, and $n < m$).

47. The display driving method as claimed in claim 44, wherein, in said second subfield arrangement setting, of the subfields to be set for light emission when displaying an arbitrary gray scale level except low gray scale levels, the most heavily weighted subfield is set for light emission along with at least one of the other subfields.

48. The display driving method as claimed in claim 44, wherein said first subfield arrangement setting sets the arrangement of said plurality of subfields to achieve said fourth number of gray scale levels, m, and said second subfield arrangement setting sets the arrangement of said plurality of subfields to achieve said second number of gray scale levels, n (where m and n are natural

numbers, and n < m).

49. The display driving method as claimed in claim 48, wherein the number of gray scale levels, m, generated in said first subfield arrangement setting and the number of gray scale levels, n, generated in said second subfield arrangement setting have a relationship such that (m-1):(n-1) is substantially equal to a ratio of integers.

50. The display driving method as claimed in claim 49, wherein said ratio (m-1):(n-1) is 2:3, 4:5, or 4:7.

51. The display driving method as claimed in claim 48, wherein the generation of said second intermediate image signal performed by further compressing the number of gray scale levels of said first intermediate image signal is accomplished by multiplying said first intermediate image signal by (n-1)/(m-1).

52. The display driving method as claimed in claim 51, wherein the generation of said second intermediate image signal performed by further compressing the number of gray scale levels of said first intermediate image signal comprises dividing n gray scale levels into a plurality of regions and multiplying said first intermediate image signal by (n-1)/(m-1) by approximating said divided regions by a broken line formed of a set of straight line segments each having a slope equal to a submultiple of a natural number.

53. The display driving method as claimed in claim 52, wherein the slope of each of said straight line segments in said broken line approximation is selected from the group consisting of 1, 1/2, 1/3, and 1/4.

54. The display driving method as claimed in claim 51, further comprising the step of multiplying each weight by (m-1)/(n-1) in order to expand said output image signal compressed through the multiplication with said coefficient (n-1)/(m-1) and output after said error diffusion.

55. The display driving method as claimed in claim

43, wherein said image signal is any one of RGB signals of red, green, and blue; and said main path, said sub path, said switch circuit, said path switching control section, said gain control circuit, said sub gain control circuit, and said error diffusion circuit are provided for each of said RGB signals.

56. The display driving method as claimed in claim 43, wherein said display apparatus is a plasma display apparatus.